AMENDMENT TO THE CLAIMS

1. (Previously Presented) A photodetector, comprising:

a plurality of semiconductor materials forming a heterojunction, the plurality of semiconductor materials comprising:

a first semiconductor material;

a second semiconductor material coupled to the first semiconductor material, the first and second semiconductor materials being halides, wherein at least one of the first and second semiconductor materials consists of a semiconductor material.

2. (Original) The photodetector of claim 1, wherein the first and second semiconductor materials have approximately the same band gap.

3. (Original) The photodetector of claim 1, wherein the first semiconductor material comprises an iodide compound and the second semiconductor material comprises mercuric iodide.

4. (Original) The photodetector of claim 3, wherein the first semiconductor material comprises lead iodide.

5. (Original) The photodetector of claim 1, further comprising:

a first contact; and

a second contact, wherein the first plurality of semiconductor materials are disposed between the first and second contacts.

6. (Original) The photodetector of claim 5, wherein at least one of the first and second contacts comprises palladium.

7. (Original) The photodetector of claim 5, wherein the second semiconductor material comprises mercuric iodide and the first semiconductor material is less chemically reactive than mercuric iodide with the contacts.

8. (Original) The photodetector of claim 1, wherein the second semiconductor material is thicker than the first semiconductor material.

9. (Original) The photodetector of claim 8, wherein the first semiconductor material has a first thickness less than approximately 250 microns.

10. (Original) The photodetector of claim 9, wherein the first semiconductor material has a first thickness less than approximately 50 microns.

11. (Original) The photodetector of claim 4, wherein the second semiconductor material is thicker than the first semiconductor material.

12 (Original) The photodetector of claim 11, wherein the first semiconductor material has a first thickness less than approximately 250 microns.

13. (Original) The photodetector of claim 12, wherein the first semiconductor material has a first thickness less than approximately 50 microns.

14. (Original) The photodetector of claim 4, wherein the plurality of semiconductor materials further comprises a third semiconductor material comprising lead iodide coupled to the second semiconductor material.

15. (Original) The photodetector of claim 14, wherein the third semiconductor material has a third thickness less than approximately 50 microns.

16. (Original) The photodetector of claim 1, wherein the second semiconductor material has a conductivity type different than the first semiconductor material.

17. (Original) The photodetector of claim 16, wherein the band gaps of the first and second semiconductor materials are within 10 percent of each other.

18. (Previously Presented) The photodetector of claim 17, wherein the first semiconductor material comprises mercuric iodide and the second semiconductor material comprises lead iodide and each of the first and second semiconductor materials consists of a semiconductor material.

19. (Original) The photodetector of claim 18, wherein the second semiconductor material is thicker than the first semiconductor material.

20. (Original) The photodetector of claim 18, wherein the plurality of semiconductor materials further comprises a third semiconductor material comprising lead iodide coupled to the second semiconductor material.

21. (Original) The photodetector of claim 1, wherein at least one of the first and second semiconductor materials comprises an iodide compound and wherein the first semiconductor material comprises bismuth iodide.

22. (Original) The photodetector of claim 21, wherein the second semiconductor material comprises mercuric iodide.

23. (Previously Presented) The photodetector of claim 21, wherein the second semiconductor material comprises lead iodide.

24. (Original) The photodetector of claim 1, wherein one of the first and second semiconductor materials comprises an iodide compound and the other of the first and second semiconductor materials comprises thallium bromide.

25. (Original) The photodetector of claim 24, wherein the one of the first and second semiconductor materials that comprises an iodide compound further comprises mercuric iodide.

26. (Original) The photodetector of claim 24, wherein the one of the first and second semiconductor materials that comprises an iodide compound further comprises lead iodide.

27. (Original) The photodetector of claim 1, wherein the photodetector is coupled to a negative bias.

28. (Original) The photodetector of claim 5, wherein the first contact is coupled to ground and the second contact is coupled to a negative voltage.

29. (Original) The photodetector of claim 8, wherein the first contact is coupled to ground and the second contact is coupled to a negative voltage.

30. (Previously Presented) A photodetector, comprising:

a first semiconductor material;

a second semiconductor material coupled to the first semiconductor material forming a heterojunction structure, wherein at least one of the first and the second semiconductor materials consists of a semiconductor material;

a contact coupled to the second semiconductor material, wherein the first and second semiconductor materials comprise means for reducing a chemical reaction with the contact; and

means for reducing dark current in the heterojunction structure.

31. (Previously Presented) A photodetector, comprising:

a first semiconductor material;

a second semiconductor material coupled to the first semiconductor material, wherein at least one of the first and the second semiconductor materials consists of a semiconductor material; and

a contact coupled to the second semiconductor material, wherein the second semiconductor material is less corrosive than the first semiconductor material to the contact.

32. (Original) The photodetector of claim 31, wherein the first and second semiconductor materials are halides.

33. (Original) The photodetector of claim 32, wherein the first and second semiconductor materials comprise iodide.

34. (Original) The photodetector of claim 33, wherein the first semiconductor material is lead iodide.

35. (Original) The photodetector of claim 34, wherein the second semiconductor material is mercuric iodide.

36. (Original) The photodetector of claim 33, wherein the second semiconductor material is mercuric iodide.

37. (Original) The photodetector of claim 33, wherein the first semiconductor material is bismuth iodide.

Claims 38-48 (Canceled)

49. (Previously Presented) A photodetector, comprising:

a plurality of semiconductor materials forming a heterojunction, the plurality of semiconductor materials comprising:

a first semiconductor material; and

a second semiconductor material coupled to the first semiconductor material, the first and second semiconductor materials consisting essentially of halides, wherein at least one of the first and second semiconductor materials consists essentially of a semiconductor material.

50. (Currently Amended) The photodetector of claim 49 wherein the first semiconductor material is lead iodide and the second semiconductor material is mercuric iodide.